

## Electrochemical element

**Publication number:** CN1341232

**Publication date:** 2002-03-20

**Inventor:** YOSHINORI NISHIKITANI (JP); KEIZO IKAI (JP);  
MASAAKI KOBAYASHI (JP)

**Applicant:** NIPPON MITSUBISHI OIL CORP (JP)

**Classification:**

**- international:** **C09K9/02; G02F1/15; C09K9/02; G02F1/01;** (IPC1-7):  
G02F1/15; C09K9/02

**- European:** C09K9/02; G02F1/15; G02F1/15V

**Application number:** CN20008003956 20000217

**Priority number(s):** JP19990040012 19990218; JP19990287739 19991008;  
JP19990295147 19991018; JP19990371850 19991227;  
JP19990371931 19991227; JP19990372370 19991228;  
JP20000026811 20000203

**Also published as:**



EP1154311 (A1)

WO0049454 (A1)

US6519072 (B2)

US2002015214 (A1)

**Report a data error here**

Abstract not available for CN1341232

Abstract of corresponding document: **EP1154311**

An electrochromic element comprises an ion conduction layer between two conducting substrates, at least one of which is transparent. The ion conduction layer contains an organic compound, which has both a structure exhibiting a cathodic electrochromic characteristic and a structure exhibiting an anodic electrochromic characteristic.

---

Data supplied from the **esp@cenet** database - Worldwide

HIT: 1 OF 1, Selected: 0 OF 0

© Thomson Scientific Ltd. DWPI

© Thomson Scientific Ltd. DWPI

**Accession Number**

2000-558333

**Title Derwent**

Electrochromic element for car mirrors and displays etc. contains organic compound which combines bipyridinium structure showing anodic electrochromic properties with metallocene structure showing cathodic electrochromic properties

**Abstract Derwent**

**Novelty:** Electrochromic element has an ion conductive layer between two conductive base plates, at least one of which is transparent. The element contains an organic compound which combines a structure showing anodic electrochromic properties with a structure showing cathodic electrochromic properties.

**Use:** Used in transparent elements such as light control glass, reflection elements such as anti-glare mirrors for e.g. vehicles and mirrors for ornaments, and display devices etc.

**Advantage:** Cheap color formers can be used. The element can be manufactured by a simple method and color tone can be changed.

**Description of Drawing:** The figure shows the element according to the invention. Transparent Base Plate (1) Transparent Electrode Layer (2) Ion Conductive Layer (3) Transparent or Reflective Electrode Layer (4) Base Plate (5) Seal Material (6) Electrode Region (8)

**Technical Focus:** ORGANIC CHEMISTRY Preferred Element: The structure showing cathodic electrochromic properties a bipyridinium ion pair structure of formula (I) A- and B- = halogen anion, ClO<sub>4</sub>-, BF<sub>4</sub>-, PF<sub>6</sub>-, AsF<sub>6</sub>-, CH<sub>3</sub>COO- and CH<sub>3</sub>(C<sub>6</sub>H<sub>4</sub>)SO<sub>3</sub>-. The structure showing anodic electrochromic properties is a metallocene structure of formula (II) or (III) R<sub>1</sub>-R<sub>2</sub> = 1-10C alkyl, alkenyl or aryl group, and, when aryl, the aryl group can form a cyclopentadienyl ring or condensed ring; m = an integer 0-4; n = an integer 0-4; M = Cr, Co, Fe, Mg, Ni, Os, Ru, V, X-Hf-Y, X-Mo-Y, X-Nb-Y, X-Ti-Y, X-V-Y or X-Zr-Y; X and Y = H, halogen or 1-12C alkyl group. Specific organic compounds are of formula (IV)-(VII) R<sub>3</sub>, R<sub>4</sub> = 1-20C hydrocarbon group; R<sub>5</sub> = 1-20C hydrocarbon group selected from alkyl, cycloalkyl, alkenyl, aryl or aralkyl, 4-20C heterocyclyl group or one of these groups where one H atom is substituted.

**Example:** An example of the organic compound is 1-(4-ferrocenyl-butyl)-1'-4,4'-bipyridinium bis (tetrafluoroborate).

**Assignee Derwent + PACO**

NIPPON MITSUBISHI OIL CORP	NIOC-S
NIPPON OIL CO LTD	NIOC-S

**Assignee Original**

NIPPON MITSUBISHI OIL CORPORATION  
NISHIKITANI, Yoshinori  
IKAI, Keizo  
KOBAYASHI, Masaaki  
IMAFUKU, Hiroshi  
MINAMI, Masaki  
KUBO, Takaya  
NIPPON MITSUBISHI OIL CORP  
NIPPON MITSUBISHI OIL CORP  
NIPPON MITSUBISHI OIL CORP  
NIPPON MITSUBISHI OIL CORP  
NIPPON MITSUBISHI OIL CORP  
Nippon Mitsubishi Oil Corporation  
Nippon Mitsubishi Oil Corporation

Nippon Mitsubishi Oil Corporation  
 Nippon Mitsubishi Oil Corporation  
 Nippon Mitsubishi Oil Corporation

**Inventor Derwent**

IAKI K	IGAI K
IKAI K	IMAFUKU H
KOBAYASHI M	KUBO T
MINAMI M	NISHIKITANI Y

**Patent Family Information**

WO2000049454-A1	2000-08-24	JP2000305116-A	2000-11-02
JP2001114796-A	2001-04-24	JP2001172293-A	2001-06-26
JP2001181292-A	2001-07-03	JP2001181293-A	2001-07-03
EP1154311-A1	2001-11-14	US20020015214-A1	2002-02-07
KR2001102154-A	2001-11-15	CN1341232-A	2002-03-20
US6519072-B2	2003-02-11	TW499620-A	2002-08-21
US20030184839-A1	2003-10-02	US6816298-B2	2004-11-09

**First Publication Date** 2000-08-24

**Priority Information**

JP000026811	2000-02-03	JP000040012	1999-02-18
JP000287739	1999-10-08	JP000295147	1999-10-18
JP000371850	1999-12-27	JP000371931	1999-12-27
JP000372370	1999-12-28		

**Derwent Class**

E11	E12	L03	P81	U14	V07
-----	-----	-----	-----	-----	-----

**Manual Code**

E05-B01	E05-L	E05-M
E05-N	L03-G05C	L03-H05
U14-K02	V07-K01A	V07-K04

**International Patent Classification (IPC)**

IPC Symbol	IPC Rev.	Class Level	IPC Scope
C07F-15/00	2006-01-01	I	C
C07F-17/00	2006-01-01	I	C
C09B-57/00	2006-01-01	I	C
C09K-9/02	2006-01-01	I	C
C09K-9/02	2006-01-01	I	C
C09K-9/02	2006-01-01	I	C
G02F-1/01	2006-01-01	I	C
G02F-1/01	2006-01-01	I	C
G02F-1/01	2006-01-01	I	C
C07F-15/02	2006-01-01	I	A
C07F-17/02	2006-01-01	I	A
C09B-57/00	2006-01-01	I	A
C09K-9/02	2006-01-01	I	A
C09K-9/02	2006-01-01	I	A
C09K-9/02	2006-01-01	I	A
G02F-1/15	2006-01-01	I	A
G02F-1/15	2006-01-01	I	A
G02F-1/15	2006-01-01	I	A
G02F-1/15	-		

**Drawing**

